

Modelling of Child Psychology Tests Based Game Learning

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Abstract—Issues that will be described in this study is on how to model a paper test of psychological test into a game that is based on game learning in order to ease psychiatrists and parents in understanding the children's psychological condition. By playing that game, children will unconsciously learn about social affairs while their's level of social intelligence are also being tested in the same time. Based on the study, it is clearly known about children's attractiveness and easiness in completing psychological test using the game learning.

Keywords; *psychological tests, social intelligence, game learning.*

I. INTRODUCTION

Age 6 to 8 is a concrete operational phase where logical thinking ability is currently developed, with a condition that objects that will become the source of that logical thought present concretely. This logical thinking ability is achieved through ability to classify the objects based on their classification, to put things in their order, ability to understand people's point of views, and ability to think deductively [1]. In these ages, children start to enter a formal education, where normal kids are supposed to interact well in their social association.

In many cases, the lack of social interaction ability and their ability to adapt are caused by the influence of children psychology. Children cannot directly judged whether they have a psychological disrupt or not. What we need is a supporting media such as psychological test as a reference for parents in detecting their children's psychological condition as early as possible [2]. To undertake psychological test, a child is brought to a psychiatrist and that will make that child follows various form of psychological tests that are mostly difficult.

Psychological tests perfomed nowadays are still manual. They only use paper test and do some observation on children's attitudes. The weakness of this test for children is that it tends to create a boring situation. In addition, it is not easy to persuade and bring the child to psychiatrist for being tested.

In some psychological cases, there are test model that have been computerized. The test is modeled in a form of digital questionnaire. The weakness of this type of test is that the given questions are still in textual form, so the children will be less interested.

Interesting point for children when they interact with computer is playing games. Realizing this interesting point, that game media can be utilized as a tool for psychological test. Although there are already game-based psychological tests provided recently, what is measured in those psychological tests are simply IQ test and children's interests and talents. The games can actually be developed to design another psychological test.

Based on the description above, this study will make a game-based psychological test modeling that is expected to become a tool in detecting and understanding the psychological condition of children in early stages through game media, so the children will not realize if they are actually undergoing a test.

II. THEORITICAL BACKGROUND

A. Modeling

Model is a representation or formalization in particular language of a real system (reality), Modeling is a stage in making a model of that real system. The compromised language used in the modeling can be in a form of natural language such as Indonesian language, image language, symbolic language, math language, or computer language [3].

Model can be represented in many ways, depend on the aims of the study. Several types of model can be grouped as follows [3]:

- a. Scale Model
- b. Symbolic Model (Mathematics)
- c. Pictorial Model
- d. Verbal Model
- e. Schematic Model
- f. Computer Model

B. Psychology

Etymologically, the word *psychology* is derived form the Greek *psyche* which means *soul* and *logos* which means

science. Therefore, psychology can also be defined as a science of soul or, to make it short, soul science. However, its object is more emphasized on human's behaviors [4]. Systematically, the scope of psychological study is divided as follows:

- Based on Human Development:
 - a. Children Psychology
 - b. Teenage Psychology
 - c. Adult Psychology
- Based on Study:
 - a. General Psychology
 - b. Specified Psychology
 Specified Psychology can further be divided into several types, including:
 - Developmental Psychology
 - Social Psychology
 - Educational Psychology
 - Personality Psychology
 - Psychopathology
 - Criminal Psychology
 - Corporation, Industry and Engineering Psychology
 - Health Psychology

C. Social Intelligence

In social life, social intelligence is inevitably needed, so every single individual will know where they really are, their position and function in social structure where they currently live in. In other words, in order to know their functions in various aspect social lives, smart and well-mannered in positioning themselves, people need a high social intelligence.

As parents, we surely think and try to develop our children's social intelligence, in order to make them able to see their position and function which is good and right in their future social structure [5].

D. Game learning

In Indonesian dictionary, "game" is defined as *permainan*. "Game consists of rules that build a competitive situation from two to some people or groups." (J. Von Neumann and O. Mortgenstern, *Theory of Games and Economic Behavior* (3d ed. 1953)) [6].

Game learning is a game used for learning that can stimulate both emotional and intelligence side. Game learning are applied in processes of learning that aims to attract children's interests and motivation in certain subjects or lessons. This genre actually refers to the content and the aims are not the real genre. Game learning is a mixture of arcade genre and sice scroller, but overall this game is categorized as learning genre which aims to stimulate children's interest through games [6].

III. IMPLEMENTATION

In this part, there will be explanations on how to model a psychological test into a learning-based game media.

A. Designing

1) Data

Data that will be modeled are based on psychiatrist in a form of psychological test to measure psychological condition of 6-to-8-year-old children. The measured psychological condition is level of social intelligence.

Data that will be resulted from the modeling will be in a form of levels of children's social intelligence range which are categorized as low, moderate, or high.

Scoring system will be shown as follows:

- Answer A = 3
- Answer B = 2
- Answer C = 3
- Score Total 1 - 10 = Children's social intelligence is low
- Score Total 11 - 20 = Children's social intelligence is moderate
- Score Total 21 - 30 = Children's social intelligence is high

2) System Development Stage

Software development stage includes system requirement, system design, implementation, and system testing and improving. The chart for that stage can be seen at Figure 3.1 as follows:

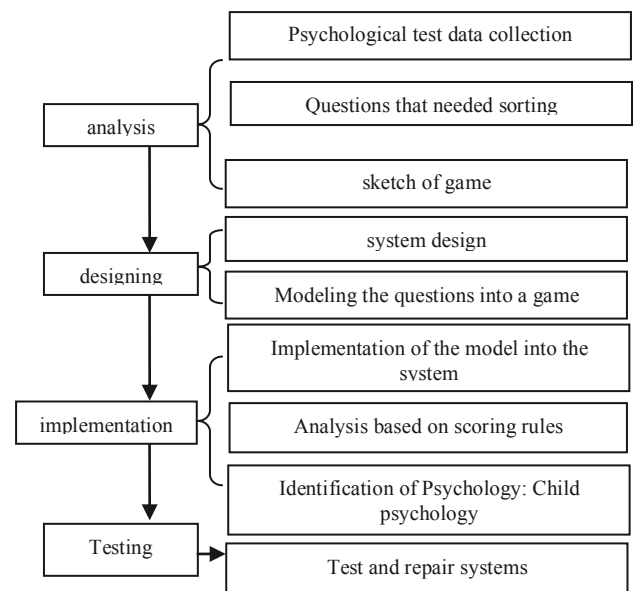


Fig. 3.1. Development System Chart

3) Modeling Stage

Stage for modeling the game-based psychological test can be seen in the chart on the Figure 3.2:

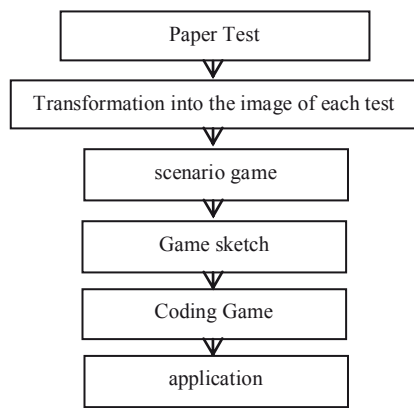


Fig. 3.2. Stages Of Modeling Chart

4) Analysis Stage

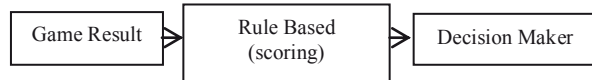


Fig. 3.3. analysis stage

Figure 3.3 is a chart of analysis stage. The result of game which is in the form of players' answer choices that will be analyzed based on scoring rules. Each score will be calculated to get the total score that will later be used in taking decision regarding the players' level of social intelligence psychology.

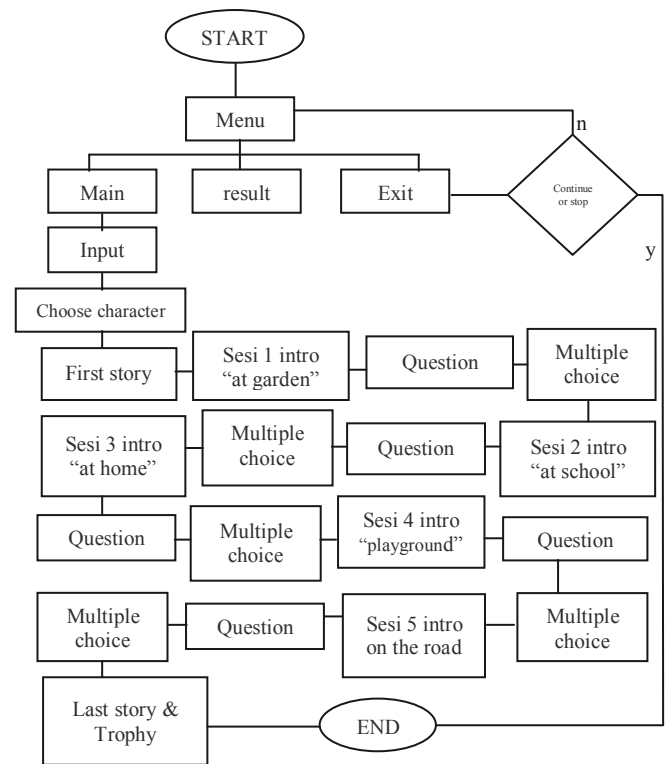


Fig.3.5.Playing-Game Diagram

3) Game Scenario

The following Table 1 is a scenario presented in the game application:

TABLE 1. GAME SCENARIO		
Number	Action	Reaction
1	The player chooses the main menu	When the player selects the Main menu, there will be a Write Your Name dialog box. The player must put his/her name and push the OK button. After pushing the OK button, the player will choose their preferable character and there will appear an initial intro in the form of first story when the player wakes up in his/her house. The game sessions are then started right after that. Session 1: the intro is a story where the player goes to a park with his/her parents on Monday. In the park, there are many games and friends who are also playing. There are bobbing-up and down game and long snake dragon. After that, there will be a question and answer choice; which games that the player will choose or the player will just stay with his/her mother and father or just sightseeing.
2	The player chooses an answer in the session 1	After completing the session 1, the player will be given scores and trophies, and player will continue to the session 2. Intro in session 2 is the player's first day in his school, recognizing his friends, teachers, and his/her school environment. When the rest time comes, there will be a

B. System Design

1) Use-Case Diagram

Figure 3.4 shows the diagram reflects an interaction between players and systems, and in this case, the actors are the players, parents and psychiatrists.

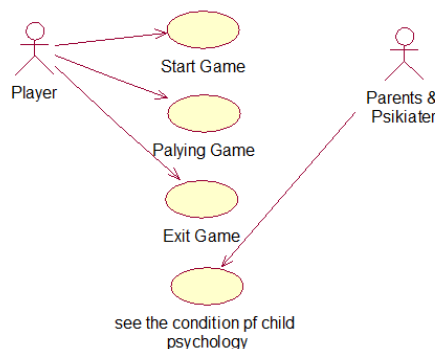


Fig. 3.4. Use case diagram



2) Playing-Game Diagram

This diagram reflects and describes the process in playing the game. The game consists of 5 sessions. There is an intro in each session in the form of introductory story and description. Each session is also equipped with questions and answer choices. After the user chooses an answer, the user will get a trophy. Figure 3.5 shows the playing-game diagram:

Number	Action	Reaction
		question and answer choices on whether the player will introduce his/her self and play with friends, introducing him/herself only to the classmates, or just simply sitting down or sighseeing.
3	The player chooses an answer in the session 2	After the player chooses his/her answer in session 2, the player will be given scores and trophies and session 3 will be started from intro located in the player's house in holiday. There will be a question and answer choices on what the player will do in the holiday.
4	The player chooses an answer in the session 3	After the player chooses the answer in session 3, the player will be given scores and trophies, and session 4 will be started with an intro located in the player's house. There many friends playing. There will be a question and answer choices about which type of game the player will choose.
5	The player chooses an answer in the session 4	After player chooses the answer in session 4, the player will be given scores and trophies, and session 5 will be started with a story intro that the player is hanging out. The player will meet a friend in a road. There will be a question and answer choices about which type of game the player will do about it.
6	The player chooses an answer in the session 5	If the player has chosen the answer in session 5, the game is ended. In last session, the player will be give scores and a golden trophy.
7	The user chooses Result menu	The system will show the total score which the player gets including the player's level of social intelligence condition.
8	The user and the player choose Close menu	The system will display a choice whether or not the player wants to stop playing the game. If the player chooses Yes, the user and the player will sign out from the application. If the player chooses No, he/she will be still in the main menu.

4) Sketch Game

The main actors in the game are shown in Tabel 2.

TABLE 2. MAIN ACTORS	
Boy actor	Girl actor
	

Initial Display of game application is shown in Figure 3.6:



Fig. 3.6. Initial Display

Figure 3.7 is the display to input a name.



Fig. 3.7. Input Name

Figure 3.8 is the display to select the character.



Fig.3.8. Select character

After selecting the character, display of the first story will then appear. After that, the player will play the game for session 1 and session 5.

Display from the result of identification is shown in Figure 3.9:



Fig. 3.9. Result Of Identification

IV. RESULT

This part will explain about the result achieved after undertaking the research. The game is simulated to 6-to-8-year-old children with 20 children aged 6 years old, 20 children aged 7 years old, and 20 children aged 8 years old. Thus, there are 60 children as the samples of this study.

Initially, the child is examined by using paper test provided by psychologist. After getting the test, the child will again be tested using a game application of psychological test. After having those two tests, the child will be given a questionnaire through interview method to know the children's interest on that game application of psychological test. Psychology analyzes the result appropriateness from the paper tests and the game application.

After undertaking the evaluation, results acquired from above study are shown in a diagram in the Figure 4.1 as follows:

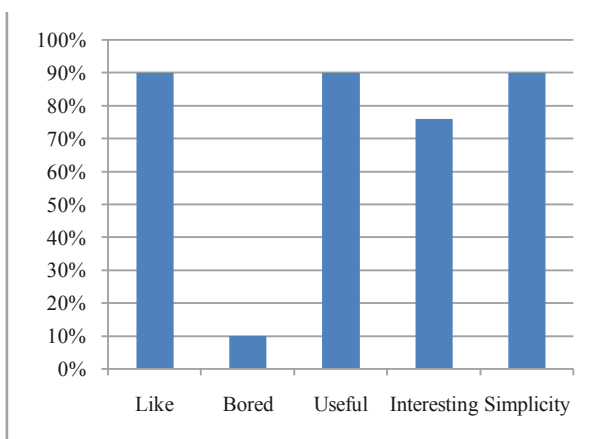


Fig. 4.1. Evaluation

Suitability of the identification of the child's social intelligence levels using the paper test and game learning are

shown in a diagram in the Figure 4.2 as follows:

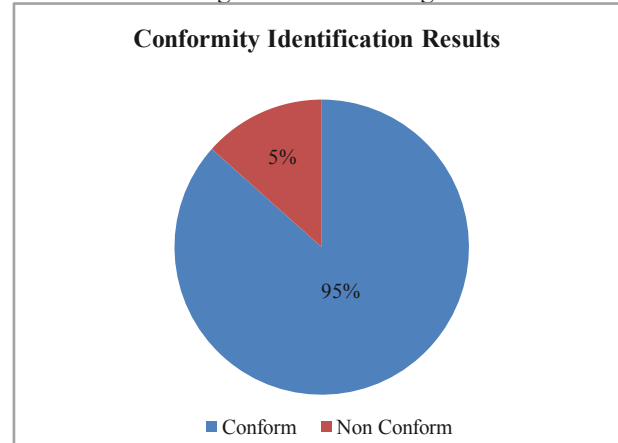


Fig. 4.2. Conformity Evaluation

CONCLUSIONS

After completing the research, observation, simulation and evaluation, the writer can conclude that psychological test aims to comprehend the children's level of social intelligence can be modeled in a learning game. In the previous game, children try to learn how to precisely socialize and how they get beneficial points in socialization. Through that game, we can measure the children's level of social intelligence, without having to observe them directly, because they are let to play the game, after that the parents can check the results in anytime they want.

Children also pleasantly play the game that they unconsciously know if they are actually learning as well as getting a test in the same time. This really prevents a direct judging, so the children remain confident.

For further interest, this application can be developed as an android-based mobile application and can also be established for other psychological tests.

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